PATENT SPECIFICATION 1,131,913

DRAWINGS ATTACHED.

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1,131,913

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COMPLETE SPECIFICATION.

Improvements in or relating to Illuminated Devices.

We, PERTINT LIMITED, of 6–8, Alie Street, London, E.1, a British company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to improvements in illuminated devices of the type described and claimed in our co-pending Patent Application No. 33966/65 (Serial No. 1,090,624). The present Application constitutes a patent of addition to the aforementioned Application.

Throughout the present Application "an illuminated device of the type described" is to be understood as constituting any device of the type under consideration and defined in the aforementioned parent Application, for instance a frame or case for display of transparencies and the like, either for domestic or for commercial purposes.

In the said parent Application No. 33966/65 (Serial No. 1,090,624) there is disclosed and claimed an illuminated device of the kind described, in which a transparent layer of small light-reflecting beads is wet-bonded to at least one face of the sheet of transparent material. In accordance with a preferred feature of the invention, the reflecting layer is formed of small glass beads set in a layer of transparent varnish. As will be evident, the reflecting layer referred to may be printed as indicia.

In accordance with the present invention, an illuminated device as claimed in claim 1 of Patent Application No. 1,090,624 comprises two or more said sheets of transparent material, being at least a front and a back sheet, which sheets are coated front or back or both with a said transparent layer of small light-reflecting beads wet-bonded thereto.

By the term "wet-bonded" there is to be understood a bond in which the refractive index from the surface of the sheet to air is changed to the refractive index from the sheet to the layer.

Advantageously, an opaque backing sheet is provided behind the back surface of the back sheet, and a transparency behind the back surface of the back sheet, and a transparency arranged to overlie the front sheet.

In accordance with a further feature of the present invention the small light reflecting beads are driven into the surfaces of at least some of the sheets while the latter are softened by heat. Alternatively, a solution of acrylic cement or the like is utilised in bonding at least some of the layers to a said sheet.

Whatever the method of fixation employed, it is advantageous that the reflective index of the beads be high relative to that of the varnish, sheet or adhesive. It is also desirable that optical wetting of the interface between the beads and other material be utilised.

Although it is preferred to use simple spherical glass beads for the formation of the transparent layers it is not essential to do so and as alternatives to such beads, small clear plastic beads or beads of powdered glass may be used. Such alternative forms of bead may also be driven into the surface of a transparent sheet or sheets by the application of heat.

As an additional step the surfaces of a transparent sheet or sheets may be roughened or marked in any suitable manner to enhance the picking up of transmitted light. If desired, a sheet or sheets may be provided with very fine screen dots

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printed thereon to give a desired effect.

In order that the invention may be more readily understood, reference will now be made to the accompanying drawings which are given by way of example and in which:—

Fig. 1*a* shows in plan view an illuminated device according to the invention and comprising two suitably pattern-coated sheets of transparent material, an opaque backing sheet and a transparency to be illuminated;

Fig. 1*b* shows the device of Fig. 1 in side view;

Fig. 2*a* shows in plan view a modified device generally similar to that of Fig. 1*a* but with a different backing sheet and with the transparency also coated in a pattern; and

Fig. 2*b* shows the device of Fig. 2*a* in side view.

With reference to Figs. 1*a* and 1*b*, an illuminated device of the kind described will be seen to comprise two co-planar transparent sheets 1 and 1*a* which are held in spaced-apart relationship within a suitable frame (not shown). The sheet 1 will be referred to hereinafter as the front sheet and the sheet 1*a* as the back sheet. At the edges of the two sheets are provided two similar illuminating strip light sources 3, a transparency 2 being laid over the front of the two sheets 1 and 1*a* and retained in a suitable frame arrangement 4, 5. Spaced in parallel relationship with the back face of the back sheet is an opaque backing sheet 2*a*.

As will be seen from the drawings, there is provided on the back face of the back sheet 1*a* a coating of small light-reflecting beads 6*a*. On the back face of the front sheet 1 there is provided a similar coating 6.

It will be evident that when the device is viewed from the front, i.e. along arrow A, there will be seen an optically combined patterning which will correspond to the light transmitted to a viewer from the coatings 6 and 6*a*. If the transparency 2 is merely transparent material then the pattern seen will correspond exactly to an optical combination of the patterns 6 and 6*a*, but if the transparency 2 also has formed thereon a pattern, what will be seen will be an optical combination of all three patterns, that is to say the pattern 6*a*, the pattern 6 and the pattern carried by the transparency 2.

As will be seen from Figs. 2*a* and 2*b*, there is provided an almost exactly similar device to that illustrated in Figs. 1*a* and 1*b* and where members are common to both the devices shown, like numerals have been employed in all figures. One difference which exists between the two devices is the provision of a pattern 7 on the back face of the transparency 2 of the device and Figs. 2 and 2*a*. Likewise, instead of an opaque backing sheet 2*a* as incorporated in the embodiment of Figs. 1*a* and 1*b*, there is provided in the embodiment of Figs. 2*a* and 2*b* a transparent backing sheet 21 on the back face of which is provided a further pattern 8. The patterns 7 and 8 are formed from any suitable light-transmitting or reflecting material.

When the embodiment of Figs. 2*a* and 2*b* is viewed from the front, i.e. along arrow A, there is seen an optical combination of the patterns produced by the patterning 7, 6, 6*a* and 8. The effect of this will be readily seen from Fig. 2*a*.

It will be appreciated that various modifications of the embodiments described are possible. For instance patterned coatings may be provided on both the front and back faces of the sheets 6 and 6*a* and in this way a composite image of at least four patterns may be provided with only the use of the two sheets 6 and 6*a*. It will also be appreciated that the patterned layers on the sheets may take any of the forms referred to in the parent Patent Application or any of the forms referred to in the preceding descriptive passages.

WHAT WE CLAIM IS:—

1. An illuminated device as claimed in claim 1 of Patent Application No. 1,090,624 in which there are provided two or more said sheets of transparent material, being at least a front and a back sheet, which sheets are coated front or back or both with a said transparent layer of small light-reflecting beads wet-bonded thereto.

2. A device as claimed in claim 1 wherein at least some of the reflecting layers are formed of beads set in a layer of transparent varnish.

3. A device as claimed in any of the previous claims wherein at least some of the layers are bonded by being driven into the surface of a said sheet.

4. A device as claimed in any of the previous claims wherein a solution of acrylic cement or the like is utilised in bonding at least some of the layers to a said sheet.

5. A device as claimed in any of the previous claims wherein the small light-reflecting beads are of glass.

6. A device as claimed in any of claims 1 to 4 wherein the small light-reflecting beads are plastic beads.

7. A device as claimed in any of claims 1 to 4 wherein the small light-reflecting beads are beads of powdered glass.

8. A device as claimed in any of the previous claims wherein the small light-reflecting beads are driven into the surfaces of at

least some of the sheets while the latter are softened by heat.

9. A device as claimed in any of the previous claims wherein at least a surface of at least one of the said sheets is roughened or marked in a manner suitable to pick up transmitted light.

10. A device as claimed in any of the previous claims wherein at least a surface of at least one of the sheets is provided with fine screen dots printed thereon.

11. A device as claimed in any of the previous claims wherein a transparency, with or without patterning thereon, overlies the front sheet.

12. A device as claimed in any of the previous claims wherein a backing sheet, with or without patterning thereon, is arranged behind the back sheet.

13. A device as claimed in claim 12 wherein the said backing sheet is at least in part opaque.

14. A device as claimed in any of the previous claims wherein some or all of the said various sheets lie parallel to one another.

15. An illuminated device of the kind described, constructed and arranged substantially as herein described with reference to and as illustrated in Figs. 1*a* and 1*b* or Figs. 2*a* and 2*b* of the accompanying drawings.

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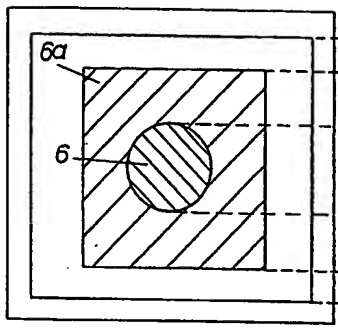
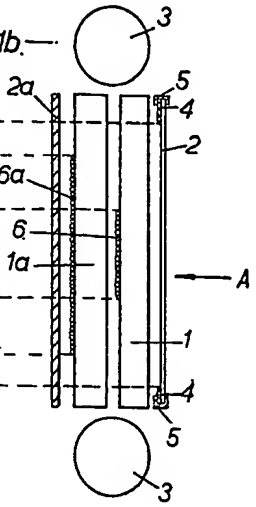
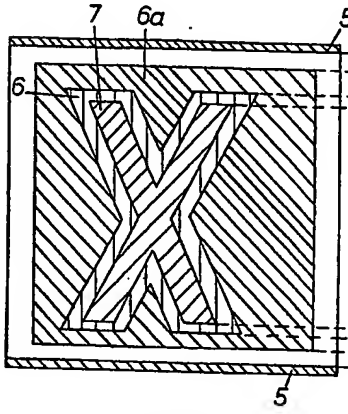
1131913 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

—FIG.1a—

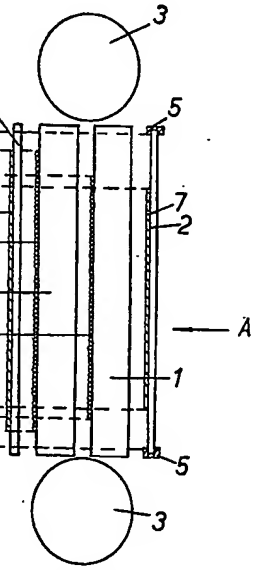


—FIG.1b—





—FIG.2a—



—FIG.2b—